PROC. ENTOMOL. SOC. WASH.
92(4), 1990, pp. 757–759

NOTE

Dispersal of the Southern Green Stink Bug, *Nezara viridula* (L.) (Heteroptera: Pentatomidae), by Hurricane Hugo

Nezara viridula (L.) (Heteroptera: Pentatomidae), called the southern green stink bug in the U.S., is native to the Ethiopian Region (Jones 1988, Ann. Entomol. Soc. Am. 81: 262–273; Hokkanen 1986, Ann. Entomol. Fenn. 52: 28–31), but now is a worldwide pest of a multitude of crops (Todd 1989, Annu. Rev. Entomol. 34: 273–292). Range expansion of *N. viridula* is ongoing although its distribution has long been cosmopolitan, including tropical areas of Asia, northern Africa, Europe, and the Americas by the 18th century (Hokkanen 1986). Most recently, the southern green stink bug has invaded the Sacramento Valley in California (Hoffmann, Wilson, and Zalom 1987, Calif. Agric. 41: 4–6).

On October 4, 1989, an adult *N. viridula* female was collected by sweep net in a soybean plot at the South Farm, Agricultural Research Center, Beltsville, Maryland. This locale is over 600 km north of the normal range for the southern green stink bug in the eastern U.S. (Jones and Sullivan 1981, Environ. Entomol. 10: 409–414); ". . . records for more northern states, like Ohio, New York, and Virginia, probably are adventitious occurrences" (Froeschner, *In* Henry and Froeschner 1988, Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States, E. J. Brill: 588). Extensive sweeping of the same and adjacent soybean plots during the following two weeks yielded no additional specimens of *N. viridula*, nor were any southern green stink bugs collected in soybean during this period from weekly sampling in Wicomico County, on the eastern peninsula of Maryland (T. C. Elden, pers. comm.). Several adults and late instars of *Euschistus* spp. stink bugs were captured at the South Farm, and fifth instars and adults of the green stink bug, *Acrosternum hilare* (Say), were exceptionally common on the eastern shore of Maryland. The errant *Nezara* female was housed in the laboratory insectary (16:8 h L:D, 28°C, 65% RH) and proceeded to oviposit fertile egg masses on October 7, 13, 19, 23, 30, and November 13. Approximately half of the eggs in the sixth mass were infertile and the female died within a week of the last oviposition date.

Shortly before midnight, September 21, a hurricane with winds in excess of 215 km/h made landfall near Charleston, South Carolina, and moved rapidly to the northwest (Fig. 1 insert; Weekly Climate Bulletin No. 89/38, U.S. Department of Commerce). Though the eye of the storm (designated "Hugo") passed east of Maryland through West Virginia, this powerful hurricane encompassed the entire eastern portion of the continent after landfall (Fig. 1; Satellite Data Service Division, U.S. Department of Commerce). Thus, the most likely explanation for the appearance of *N. viridula* in Maryland is that the insect was swept northward from South Carolina by the intense counterclockwise, uplifting winds of the hurricane and deposited some 13–14 h later in Maryland. This scenario is supported by the knowledge that the insect is capable of sustained flight for at least 12 h (Kester and Smith 1984, Entomol. Exp. Appl. 35: 75–81) and, in fact, has often been collected more than 150 km from land without abnormally strong winds (ref. in Hokkanen 1986; Baust, Benton, and Aumann 1981,

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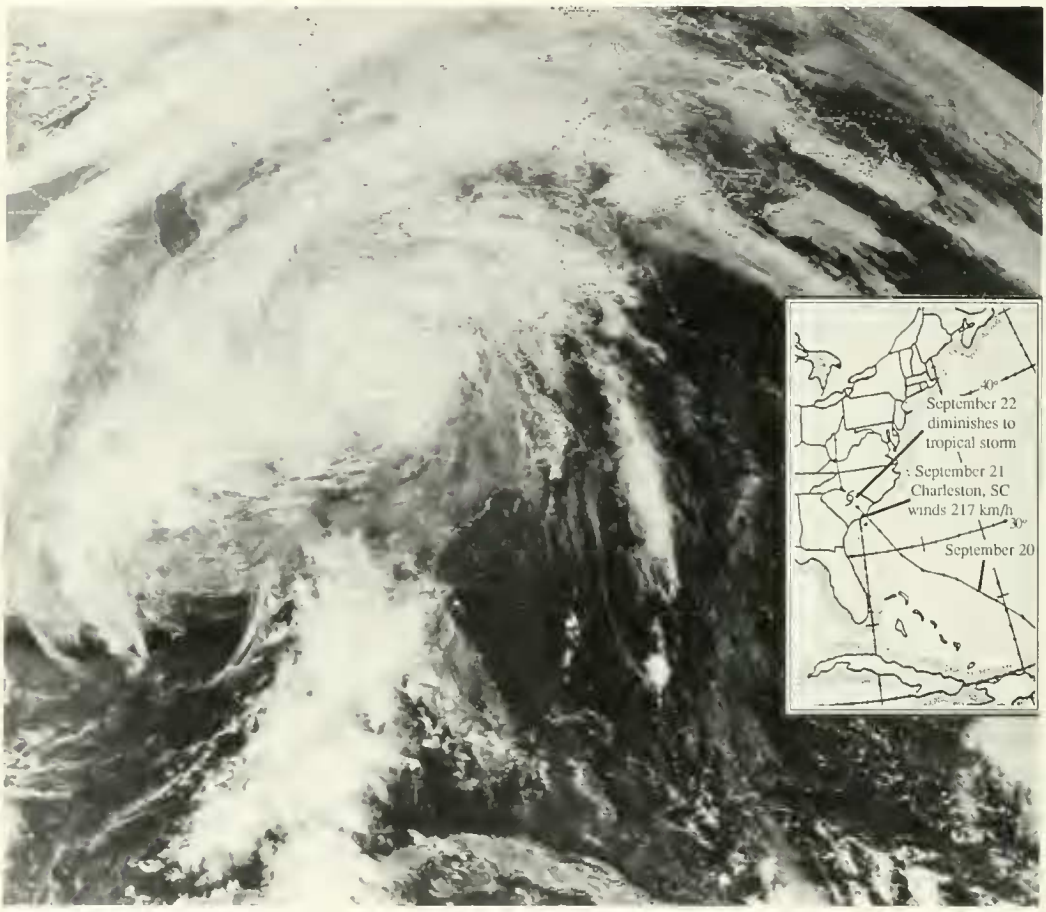

Fig. 1 Photograph: Satellite view of Hurricane Hugo at ca. 13:30, September 22, 1989. Insert: Path of Hugo the day before and after landfall.

Bull. Entomol. Soc. Am. 27: 23–25; Sparks, Jackson, Carpenter, and Muller 1986, Ann. Entomol. Soc. Am. 79: 132–139).

Dissection of five *A. hilare* females collected October 5 in Wicomico County, Maryland, revealed that these bugs were committed to diapause (large fat body with little ovarian development); a similar condition might be expected for the *Nezara* female in question had she developed in Maryland. Moreover, aeration of 18 F_1 *N. viridula* males (ca. 10 days old) produced a pheromone extract that was indistinguishable by gas chromatography from pheromone of *N. viridula* males from the southeastern U.S. (Aldrich, Lusby, Marron, Nicolaou, Hoffmann, and Wilson 1989, Naturwissenschaften 76: 173–175).

This record of a fertile *N. viridula* female about 750 km north of its probable point of origin near Charleston, South Carolina, provokes the question: Will the southern green stink bug, and other insects of similar distribution in the southeastern U.S., be encountered farther north next season than usual? In describing the long-range dispersal of certain aquatic Heteroptera via hurricanes, Herring (1958, Pan-Pac. Ent. 34: 174, 175) emphasized that "Hurricanes are not rare phenomena but occur with amazing frequency in the tropics and provide a dynamic means of distributing organisms." As

such, hurricanes should be included among Wellington's "exploitable kinds of weather" available to insects for the evolution of dispersive adaptations (1983, Bull. Entomol. Soc. Am. 29: 24–29).

I thank Dr. Owen Thompson, Department of Meteorology, University of Maryland, College Park, for helpful discussions about hurricanes and for showing me the satellite video of the landfall of hurricane Hugo. I am especially grateful to Thomas C. Elden, USDA-ARS, Germplasm Quality and Enhancement Laboratory, Beltsville, for informing me of stink bug infestations in soybean and helping to collect bugs. Tom Elden also reviewed the manuscript, as did Kent D. Elsey and Thomas J. Henry, for which I am grateful.

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